

THE SATELLITE BOOK

Satellite Telephony

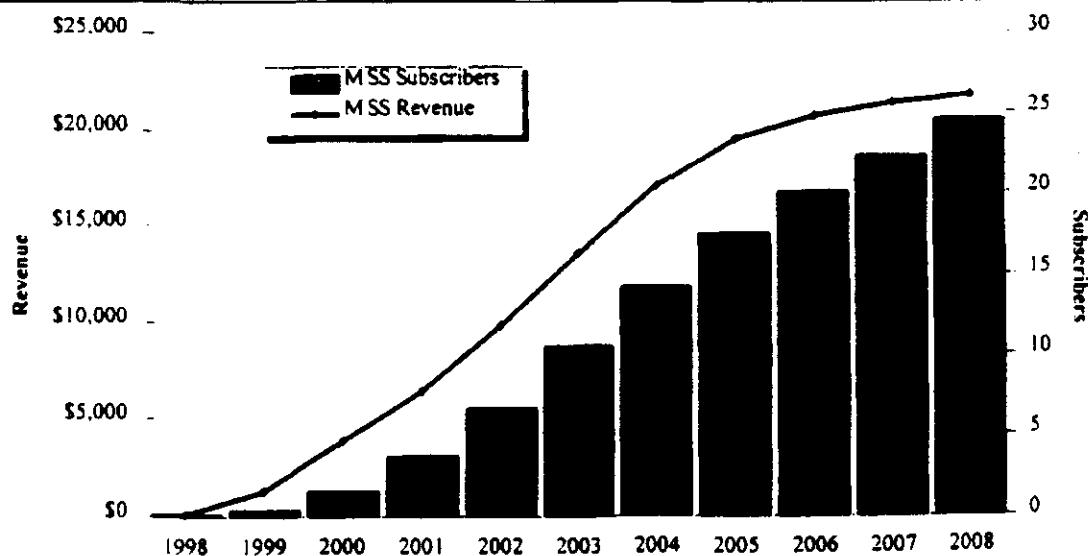
- We see telephony as attractive in the long-term, but Iridium's short-term subscriber ramp-up problems make us cautious. Satellite telephony systems are a valuable complement to today's cellular infrastructure. We estimate that current cellular networks cover approximately 10% of the world's surface area. Satellite systems should take over where terrestrial systems leave off.
- Early-stage industry with immense long-term potential. We expect satellite telephony systems to serve over 17 million subscribers by 2005. This growth comes from a base of approximately 100,000 subscribers (including Inmarsat) as of year-end 1998.
- Despite the latency disadvantages GEO systems have vs. LEO systems, we expect regional GEOs to carve out relatively defined markets based upon their local market know-how and consumer familiarity.
- Poor urban service quality may set back initial consumer acceptance. First generation satellites may have difficulty working in metropolitan areas. When using the phones outdoors, buildings can block a handset's line of sight to the satellite(s), potentially disrupting service.
- Global start-ups come with difficulties. Despite the service merits of satellite telephony, Iridium's slow start has shown that subscribers don't find providers, but rather, providers must find subscribers. This is a complex task for a company, whose marketplace encompasses 150 to 200 countries, varying regulations, numerous distributors and countless cultural and language barriers.

Satellite Telephony (MSS): Industry Forecast

(millions)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Subscriber Fee & Usage Revenue*	\$36	\$476	\$2,037	\$4,804	\$8,071	\$11,973	\$15,458	\$18,092	\$19,416	\$20,309	\$20,691
Equipment Revenue	\$45	\$811	\$1,859	\$1,579	\$1,676	\$1,559	\$1,514	\$1,376	\$1,196	\$1,069	\$1,004
MSS Industry Revenue	\$101	\$1,287	\$3,896	\$6,383	\$9,748	\$13,533	\$16,972	\$19,468	\$20,613	\$21,378	\$21,700
% Change	1174.5%	202.7%	63.8%	52.7%	38.8%	25.4%	14.7%	6.9%	1.7%	1.5%	1.5%

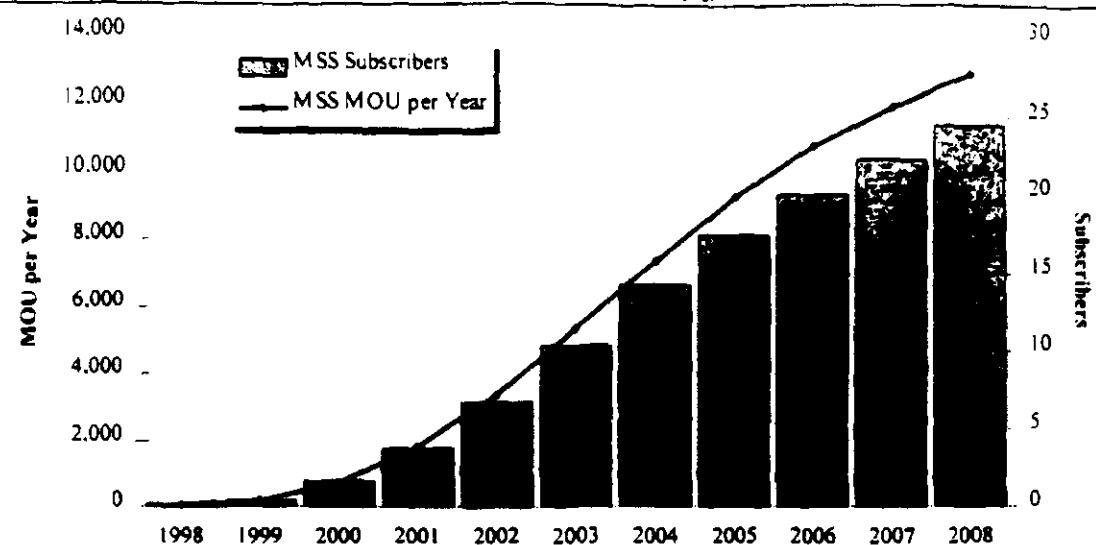
Source: C.E. Unterberg, Towbin

* retail rates, excludes terrestrial long distance tariffs

Satellite Telephony (MSS): Industry Forecast (millions)

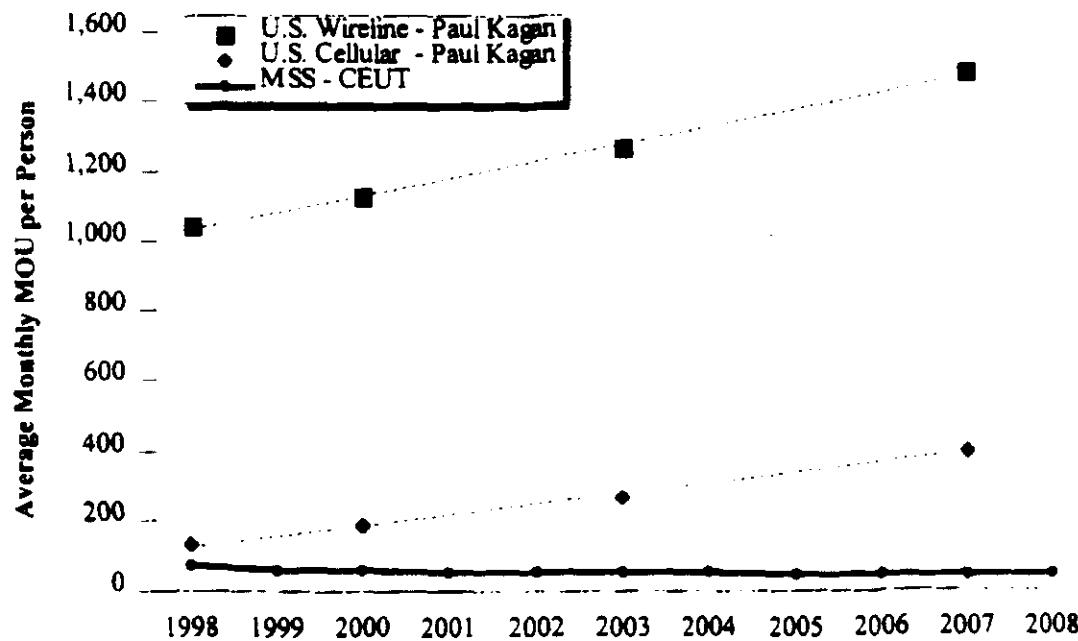
Source: C.E. Unterberg, Towbin

Satellite Telephony (MSS): Minutes of Use (MOU) and Subscribers (millions)



Source: C.E. Unterberg, Towbin (MOUs in millions)

Satellite Telephony (MSS): Monthly MOU - Usage will decline on a person basis, but increase overall



Source: C.E. Unterberg, Towbin, Paul Kagan Associates

Satellite Telephony (MSS): Subscriber Forecast											
(millions)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
World Population(a)	5,918.6	5,996.2	6,073.1	6,149.4	6,225.5	6,301.4	6,377.2	6,452.8	6,528.3	6,603.9	6,680.3
Cellular Subscribers (b)	385.8	365.7	450.0	533.1	614.3	643.0	741.5	793.4	833.1	866.4	901.1
Cellular Penetration	4.8%	6.1%	7.4%	8.7%	9.9%	11.0%	11.6%	12.3%	12.8%	13.1%	13.6%
Satellite Telephony Subscribers											
Iridium	0.003	0.210	0.525	0.983	1.583	2.255	2.819	3.270	3.663	4.029	4.391
Globalstar	0.000	0.020	0.455	0.983	1.583	2.255	2.819	3.270	3.663	4.029	4.391
ICO	0.000	0.000	0.100	0.600	1.200	1.920	2.688	3.226	3.613	3.974	4.332
Ellipso	0.000	0.000	0.000	0.000	0.250	0.750	1.313	1.838	2.205	2.536	2.840
ECCO	0.000	0.000	0.000	0.000	0.250	0.475	0.713	1.033	1.343	1.612	1.853
Other/Regional GEOs	0.082	0.126	0.513	1.134	1.814	2.721	3.809	4.761	5.571	6.128	6.741
Total	0.085	0.356	1.395	3.700	6.680	10.076	14.160	17.398	20.057	22.307	24.549
% Change											
Iridium	N/M	150.0%	87.3%	61.0%	42.5%	25.0%	16.0%	12.0%	10.0%	9.0%	
Globalstar	na	2175.0%	116.1%	61.0%	42.5%	25.0%	16.0%	12.0%	10.0%	9.0%	
ICO	na	na	500.0%	100.0%	60.0%	40.0%	30.0%	20.0%	10.0%	9.0%	
Ellipso	na	na	na	na	200.0%	75.0%	40.0%	20.0%	15.0%	12.0%	
ECCO	na	na	na	na	90.0%	50.0%	45.0%	30.0%	20.0%	15.0%	
Other/Regional GEOs	52.6%	310.0%	120.0%	60.0%	50.0%	40.0%	25.0%	17.0%	10.0%	10.0%	
MSS Subscribers	316.6%	348.5%	131.9%	80.3%	55.3%	36.3%	22.9%	15.3%	11.3%	10.0%	
Worldwide Wireless Subscribers	285.9	366.1	451.6	537.1	621.0	703.4	755.7	810.8	853.1	888.7	925.6
MSS subs. as a % of World Pop	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.3%	0.3%	0.3%	0.4%
MSS subs. as a % of Cellular Subs	0.0%	0.1%	0.4%	0.7%	1.1%	1.5%	1.9%	2.3%	2.4%	2.6%	2.7%
Market Share											
Iridium	3.5%	59.0%	32.9%	26.6%	23.7%	21.7%	19.9%	18.8%	18.3%	18.1%	17.9%
Globalstar	0.0%	5.6%	28.5%	26.6%	23.7%	21.7%	19.9%	18.8%	18.3%	18.1%	17.9%
ICO	0.0%	0.0%	6.3%	16.2%	18.0%	18.5%	19.0%	18.5%	18.0%	17.8%	17.6%
Ellipso	0.0%	0.0%	0.0%	0.0%	3.7%	7.2%	9.3%	10.6%	11.0%	11.4%	11.6%
ECCO	0.0%	0.0%	0.0%	0.0%	3.7%	4.6%	5.0%	5.9%	6.7%	7.2%	7.6%
Other/Regional GEOs	96.5%	35.3%	32.3%	35.0%	27.2%	26.2%	26.9%	27.4%	27.8%	27.5%	27.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New Subscriber Market Share											
Iridium	76.6%	25.4%	21.8%	20.1%	18.2%	14.9%	13.9%	14.8%	16.3%	16.2%	
Globalstar	7.4%	35.1%	25.1%	20.1%	18.2%	14.9%	13.9%	14.8%	16.3%	16.2%	
ICO	0.0%	8.1%	23.8%	20.1%	19.5%	20.3%	16.6%	14.6%	16.1%	16.0%	
Ellipso	0.0%	0.0%	0.0%	8.4%	13.5%	14.9%	16.2%	13.8%	14.7%	13.6%	
ECCO	0.0%	0.0%	0.0%	8.4%	6.1%	6.3%	9.9%	11.7%	11.9%	10.8%	
Other/Regional GEOs	16.0%	31.4%	29.4%	22.8%	24.5%	28.8%	29.4%	30.4%	24.8%	27.3%	
Net Subscriber Additions	0.27	1.24	2.10	2.98	3.70	3.78	3.24	2.66	2.25	2.24	

Source: C.E. Unterberg, Towbin

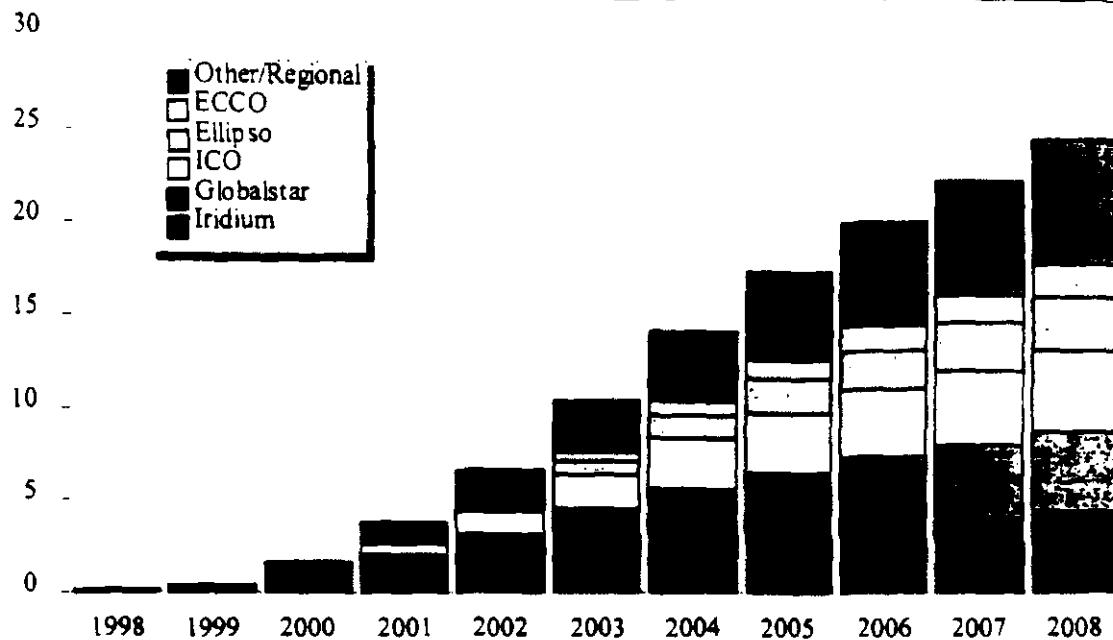
Other Sources: (a) U.S. Census Bureau; (b) Strategis Group 1998-2003

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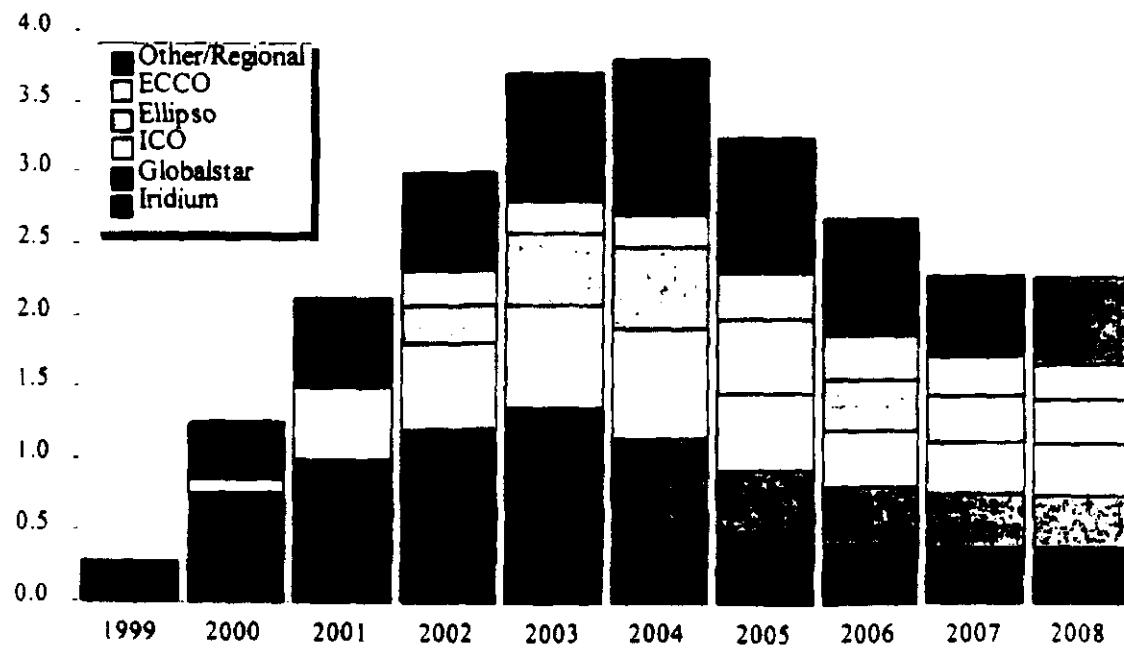
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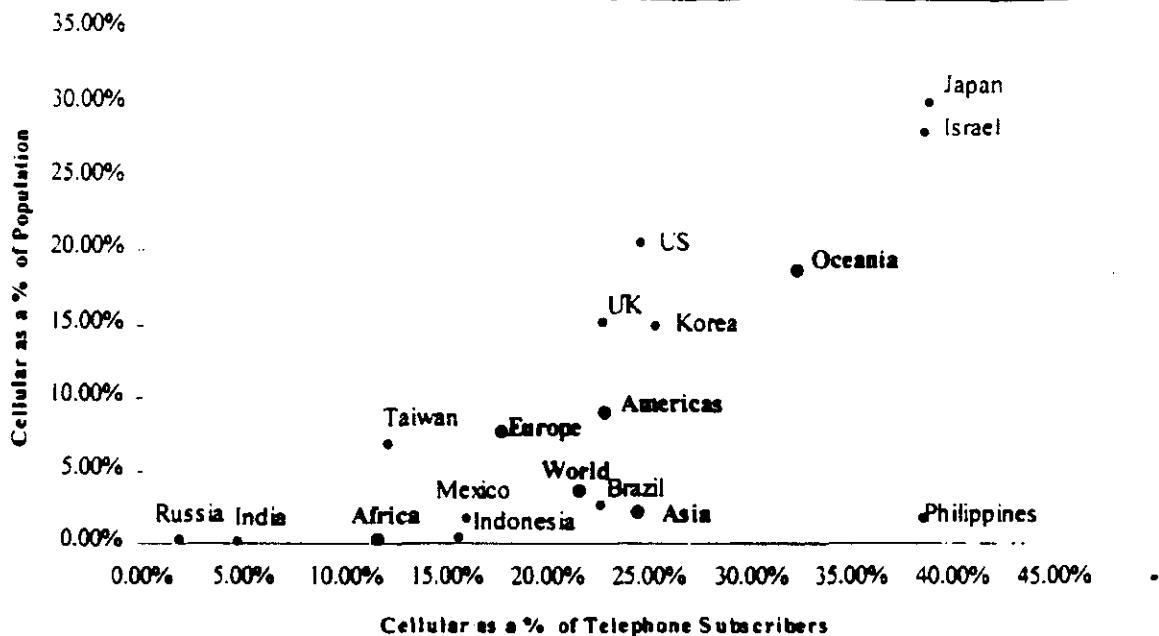
Satellite Telephony (MSS): Subscriber Forecast (millions)



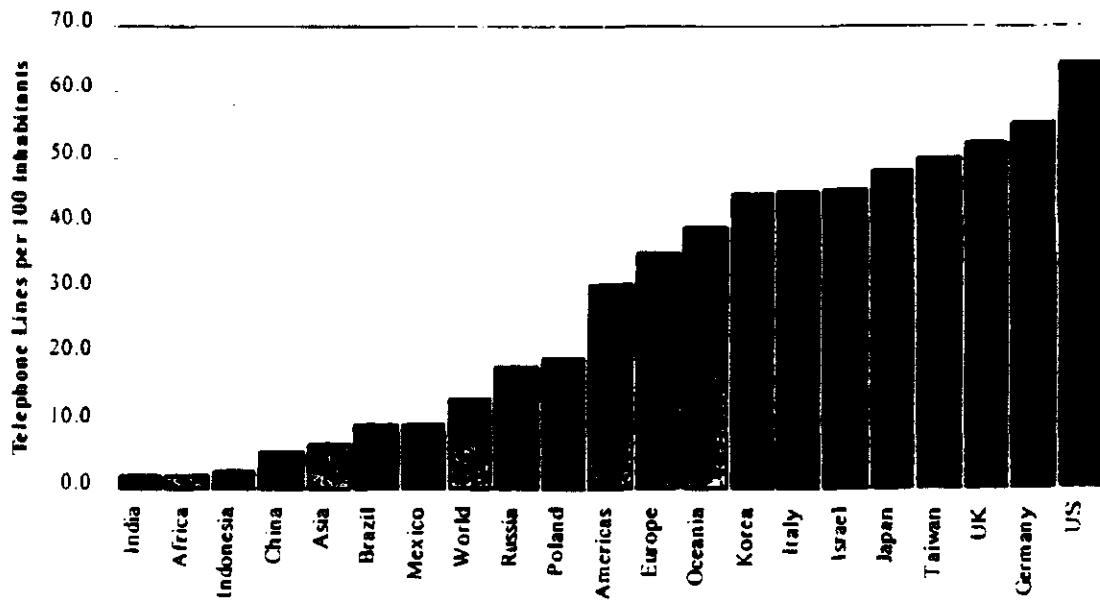
Source: C.E. Unterberg, Towbin

Satellite Telephony (MSS): Incremental Subscriber Growth (millions)

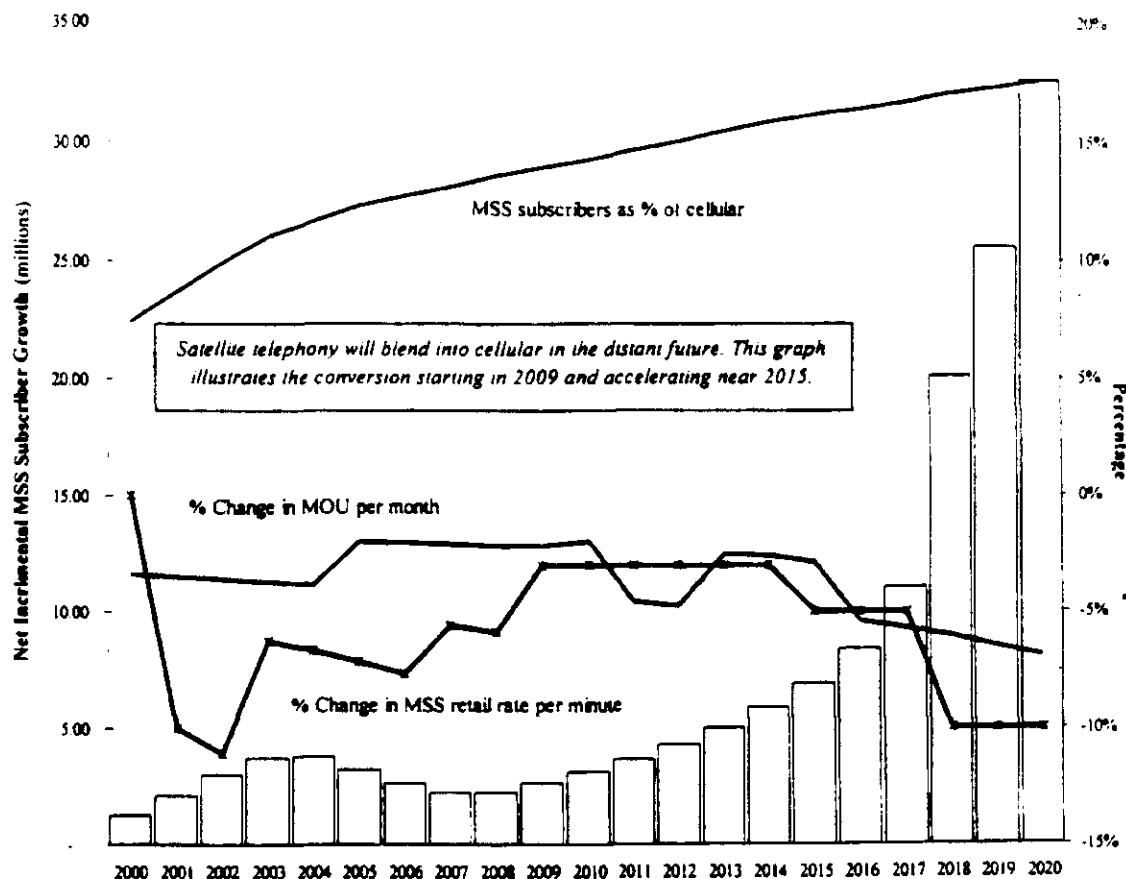


Cellular Penetration Analysis by Region/Country

Source: International Telecommunications Union; C.E. Unterberg, Towbin

Teledensity of Select Countries

Satellite Telephony (MSS): Long-term Industry Vision



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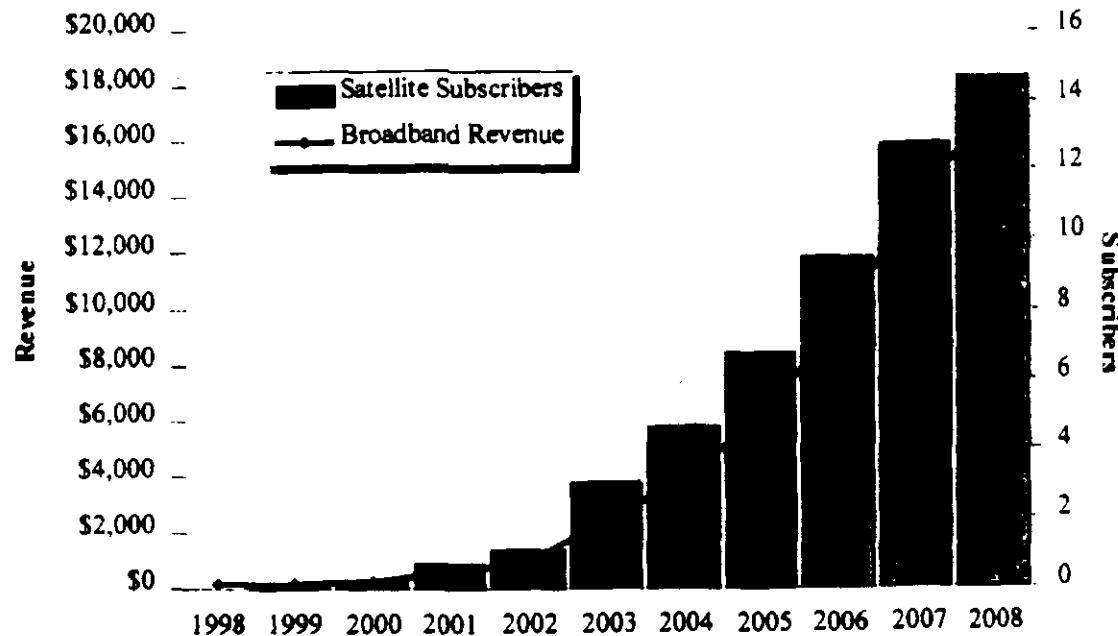
Satellite Broadband Services

- We expect 14.7 million satellite broadband subscribers by 2008 accounting for approximately 9.8% of the broadband market.
- Two-way satellite broadband already exists, but high costs currently limit satellite broadband to commercial applications. Hughes' DirectPC and Gilat's SkySurfer already deliver two-way broadband services via satellite, but at price points too high for consumer and some commercial use.
- Satellite broadband projects continue to fall by the roadside. Reality has set in for some satellite providers. Potential satellite broadband providers face numerous obstacles: I) making the requisite hardware affordable to consumers; II) using the Ka-band; and III) raising the billions in required financings. Due to these difficulties, projects like Motorola's Celestri were dropped and Cyberstar and Teledesic were scaled back.
- By 2003, we expect at least one broadband system to be in full swing after being deployed in 2001/2002.

Satellite Broadband Services: Industry Forecast**

(millions)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Broadband Industry Revenue**	\$140	\$178	\$252	\$558	\$882	\$2,463	\$3,863	\$6,151	\$9,447	\$13,819	\$17,230
% Change	26.9%	41.9%	121.1%	58.2%	179.3%	56.8%	59.2%	53.6%	46.5%	14.7%	

Source: C.E. Unterberg, Towbin ** satellite based services

Satellite Broadband Services: Industry Forecast (in millions)**

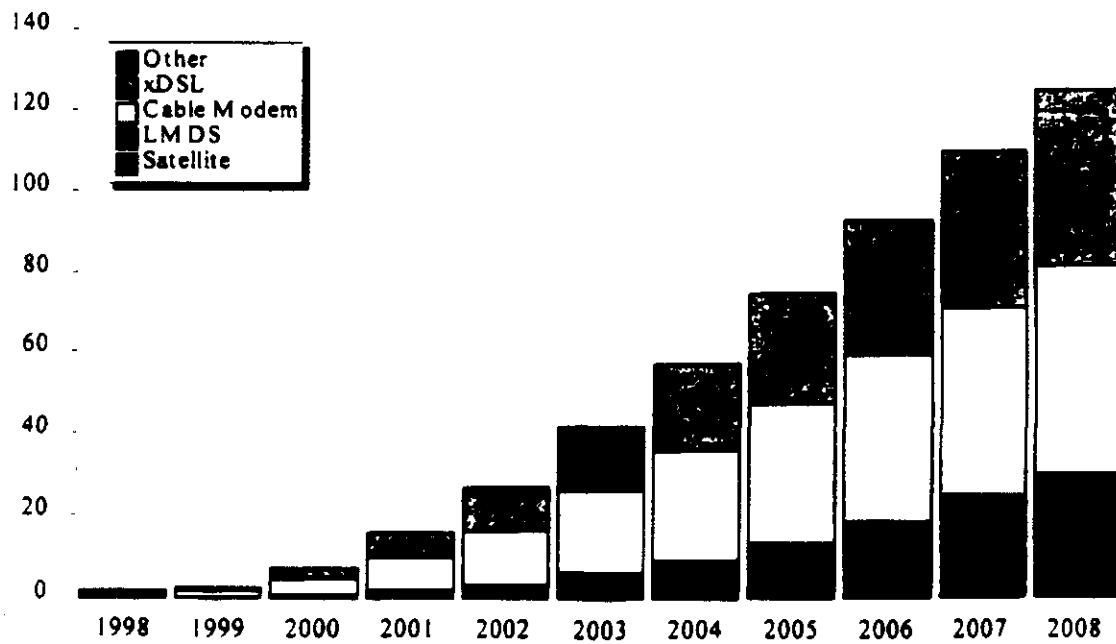
Source: C.E. Unterberg, Towbin ** satellite based services

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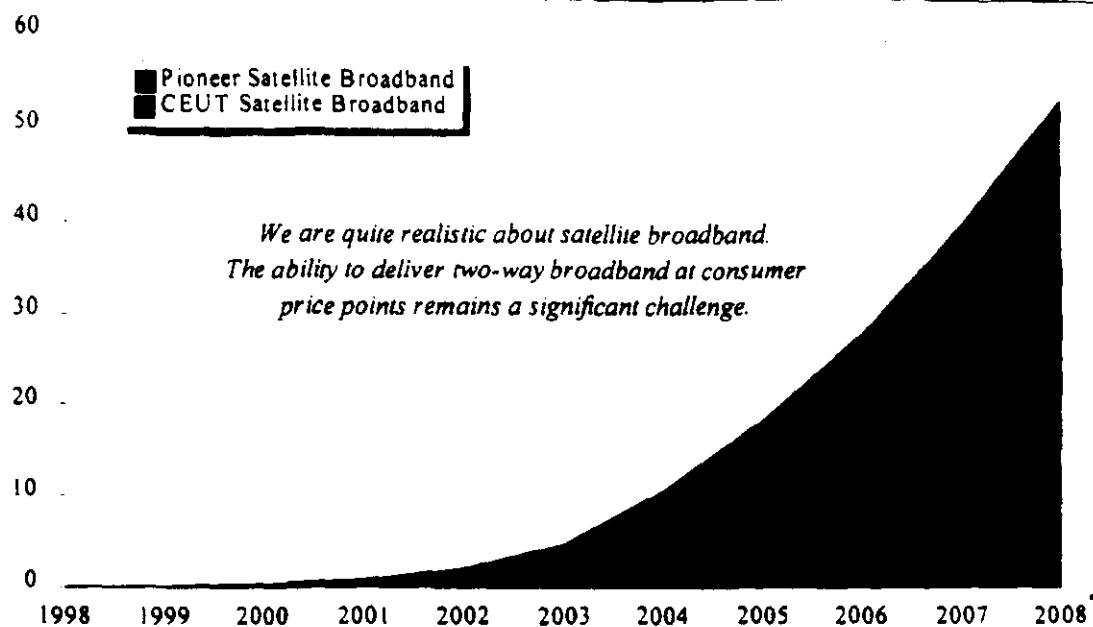
Broadband: Subscribers by Technology

(millions)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Subscribers											
LMDS	0.00	0.07	0.26	0.85	1.54	2.56	4.00	5.95	8.34	11.16	14.41
Satellite	0.03	0.07	0.20	0.65	1.09	3.01	4.96	6.71	9.48	12.73	14.70
Cable Modem	0.57	1.52	4.24	8.54	13.72	19.99	26.86	34.35	41.00	46.78	51.67
xDSL	0.20	0.69	2.20	5.32	9.93	15.57	21.45	27.20	33.00	38.49	43.67
Other	0.16	0.47	1.38	3.07	5.26	8.23	11.37	14.84	18.36	21.83	25.24
Total	0.96	2.82	8.28	18.43	31.54	49.36	68.24	89.03	110.18	130.99	149.69
% Change											
LMDS	NA	271%	227%	81%	66%	56%	49%	40%	34%	29%	
Satellite	133%	186%	225%	68%	176%	51%	47%	41%	34%	15%	
Cable Modem	167%	179%	101%	61%	46%	34%	28%	19%	14%	10%	
xDSL	245%	219%	142%	87%	57%	38%	27%	21%	17%	13%	
Other	194%	194%	123%	71%	57%	38%	30%	24%	19%	16%	
Total	194%	194%	123%	71%	57%	38%	30%	24%	19%	14%	
Technology Share											
LMDS	0.0%	2.5%	3.1%	4.6%	4.9%	5.2%	5.9%	6.7%	7.6%	8.5%	9.6%
Satellite	3.1%	2.5%	2.4%	3.5%	3.5%	6.1%	6.7%	7.5%	8.6%	9.7%	9.8%
Cable Modem	59.4%	53.9%	51.2%	46.3%	43.5%	40.5%	39.4%	38.6%	37.2%	35.7%	34.5%
xDSL	20.8%	24.5%	26.6%	28.9%	31.5%	31.5%	31.4%	30.6%	29.9%	29.4%	29.2%
Other	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Pioneer Consulting (except for satellite subscribers); C.E. Unterberg, Towbin

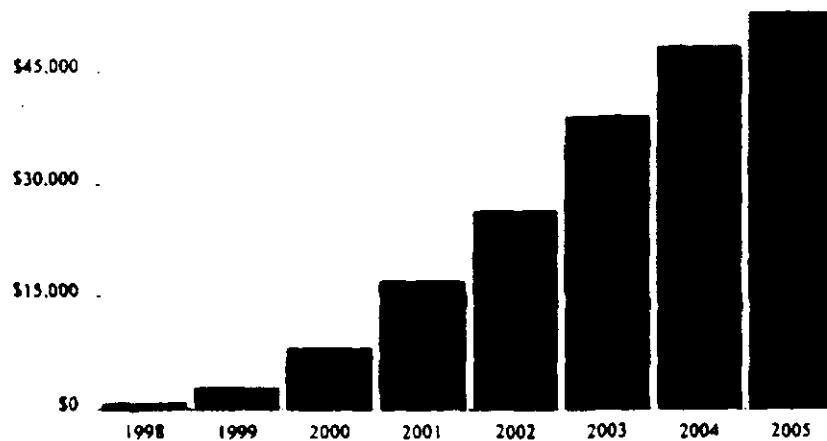
Broadband: Subscribers by Technology (millions)

Source: Pioneer Consulting (except for satellite subscribers); C.E. Unterberg, Towbin

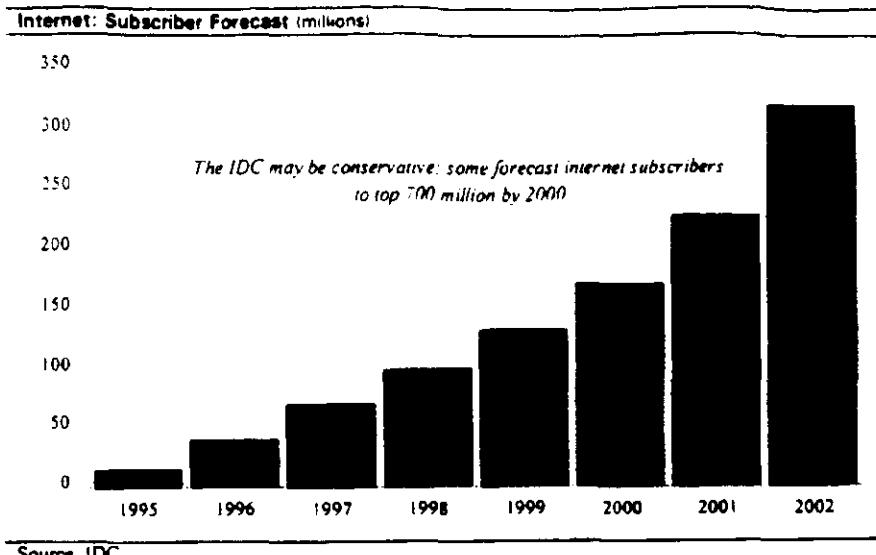
Broadband: Satellite Broadband Subscribers - CEUT vs. The Consultants**

Source: C.E. Unterberg, Towbin

**Pioneer Consulting estimates as of 12/1/98. Pioneer 2008 estimate implied

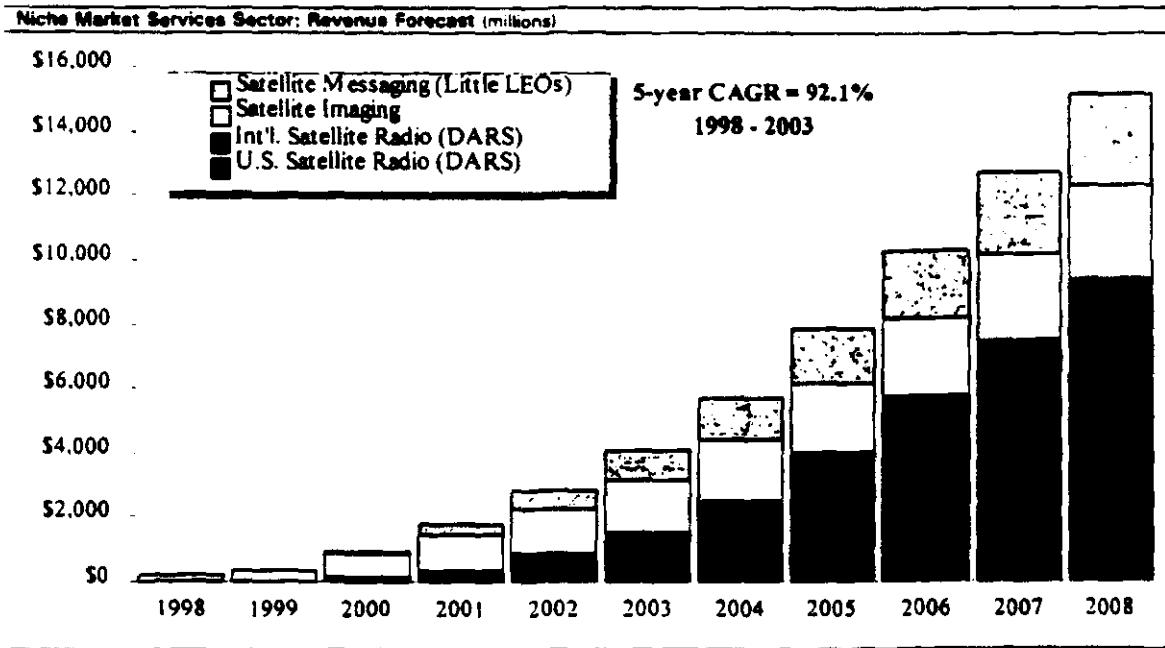
Broadband: Cumulative Investment Required (millions)

Source: Pioneer Consulting



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Satellite Radio (BARS)
Satellite Messaging (Little LEOs)
Satellite Imaging (Remote Sensing)



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Satellite Radio (DARS)

- Satellite radio (DARS) will emerge to become a \$7.5 billion global industry by 2007.

U.S.

- DARS could be the next consumer phenomena. DARS has the ability to improve terrestrial radio's potential by offering a better signal quality, greater coverage and fewer commercials. The potential is immense. There are over 178 million addressable vehicles and 100 million households that DARS services could target.
- Factory-installed DARS car receivers should accelerate subscriber growth. DARS receivers may soon be a standard option in new cars, since DARS providers are currently negotiating agreements with auto manufacturers to have receivers factory-installed. We believe that if DARS receivers become a standard equipment/option, consumers will be more inclined to purchase the service. Nevertheless, we also believe that aftermarket sales will be quite meaningful.
- We expect CD Radio and XM Satellite to radio to evenly split the auto market. However, CD Radio Radio does not plan to enter the home market initially, leaving the home market to XM Satellite Radio. Therefore, on a combined basis, we expect XM Satellite Radio to have a slightly higher share of the overall DARS market.
- We project U.S. DARS penetration to reach roughly 18% by 2008.

International

- International DARS services, currently just WorldSpace, will be an invaluable service to consumers in emerging markets. Those consumers often face a lack of programming breadth; in very remote locations, many do not currently have any radio reception.
- Given the lower income per capita and the difficulties in target marketing an international DARS service, we expect its penetration rates to be a fraction of those initially experienced in the U.S.

Satellite Radio (DARS): Industry Forecast**

(millions)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Industry Revenue											
U.S. DARS	\$0	\$0	\$7	\$131	\$343	\$701	\$1,233	\$1,975	\$2,973	\$4,043	\$5,275
Intl. DARS, excl U.S.	\$0	\$10	\$97	\$213	\$479	\$801	\$1,258	\$2,017	\$2,755	\$3,408	\$4,070
Worldwide DARS Industry	\$0	\$10	\$104	\$344	\$822	\$1,502	\$2,491	\$3,992	\$5,728	\$7,451	\$9,545
% change											
U.S. DARS			na	1904.6%	162.3%	104.5%	75.9%	60.2%	50.5%	36.0%	30.4%
Intl. DARS, excl U.S.				896.6%	119.8%	124.5%	67.2%	57.1%	60.3%	36.6%	23.7%
Worldwide DARS Industry				963.5%	232.0%	138.8%	82.8%	65.9%	60.3%	43.5%	30.1%

Source: C.E. Unterberg, Towbin

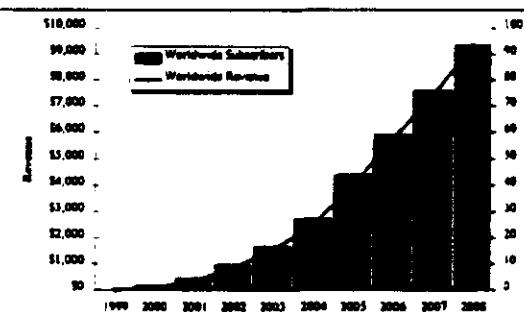
**excl. DARS equipment revenue

Satellite Radio (DARS): Subscriber Forecast

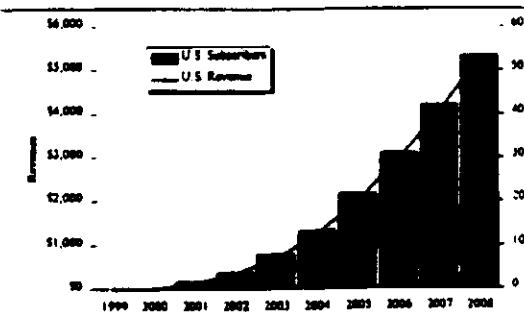
(millions)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
World Population (a)	5,918.6	5,996.2	6,073.1	6,149.4	6,225.5	6,301.4	6,377.2	6,452.8	6,528.3	6,603.9	6,680.3
% Covered by DARS system	0.0	80.9%	80.9%	81.9%	82.8%	83.8%	84.7%	85.7%	86.6%	87.6%	88.5%
Target Population	0.0	4,851.3	4,913.4	5,033.6	5,155.2	5,278.0	5,402.2	5,527.8	5,654.5	5,782.9	5,869.4
DARS Subscribers/Receivers	0.00	0.18	1.48	4.21	9.63	16.44	27.02	43.54	58.88	75.92	93.43
Penetration (Target)	0.00%	0.00%	0.03%	0.08%	0.19%	0.31%	0.50%	0.79%	1.04%	1.31%	1.59%
Penetration (World)	0.00%	0.00%	0.02%	0.07%	0.15%	0.26%	0.42%	0.67%	0.90%	1.15%	1.41%

Source: C.E. Unterberg, Towbin

Other Sources: (a) U.S. Census Bureau

Satellite Radio (DARS): Industry Forecast (millions)**

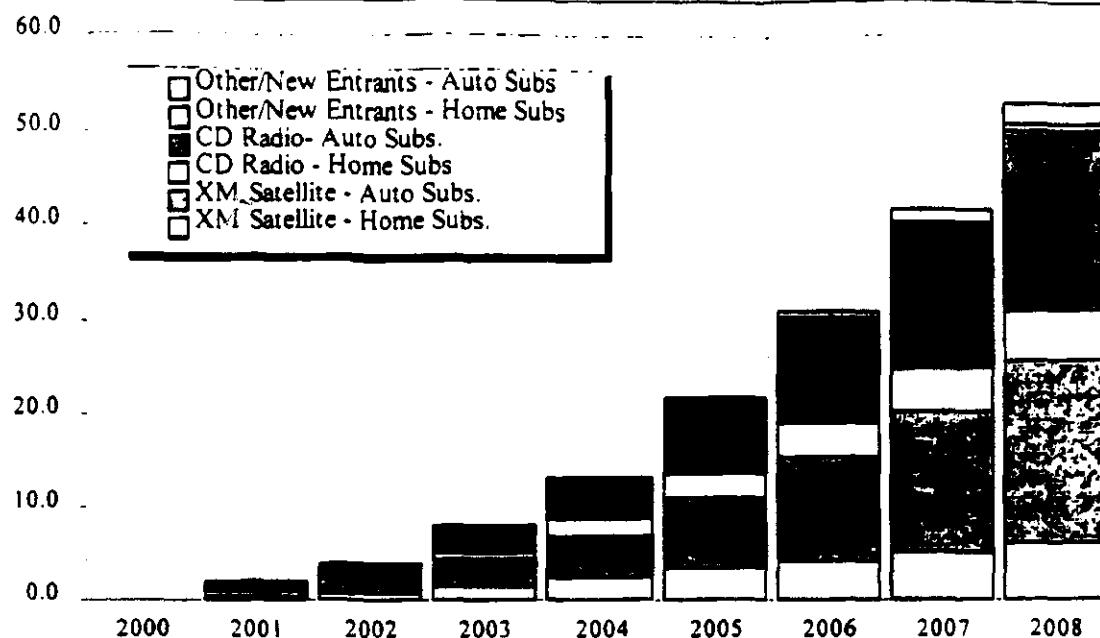
Source: C.E. Unterberg, Towbin ** excl. equipment revenue

Satellite Radio (DARS): U.S. Industry Forecast (millions)**

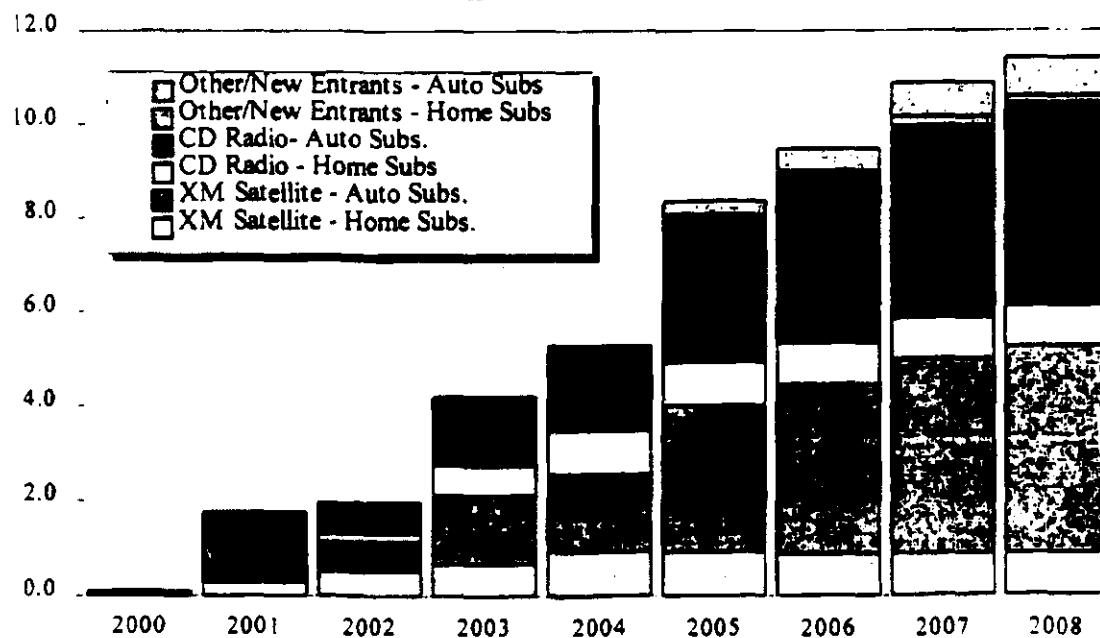
Source: C.E. Unterberg, Towbin ** excl. equipment revenue

Satellite Radio (DARS): U.S. Subscriber Forecast											
(millions)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Automobile Market											
Licensed Drivers (a)	188.4	192.6	196.8	200.7	204.7	208.8	213.0	216.6	220.3	224.1	227.4
Enabled Vehicles	178.2	182.2	186.2	190.3	194.4	198.7	203.1	207.6	212.1	216.8	219.8
% Change	3.1%	2.2%	2.2%	2.0%	2.0%	2.0%	2.0%	1.7%	1.7%	1.7%	1.7%
DARS Auto Subscribers	0.00	0.00	0.09	1.52	2.72	5.56	8.94	15.36	22.91	31.87	41.32
% Change	na	na	na	1535.2%	78.8%	104.4%	60.6%	71.9%	49.1%	39.1%	29.7%
Household Market											
US Population (b)	268.7	271.6	274.6	276.8	279.0	281.3	283.5	286.0	287.1	288.2	289.3
US Households(c)	101.0	102.1	103.3	104.3	105.4	106.0	106.6	107.1	107.5	108.0	108.5
% Change	47.1%	1.1%	1.1%	0.8%	0.8%	0.8%	0.8%	0.9%	0.4%	0.4%	0.4%
DARS Home Subscribers	0.00	0.00	0.00	0.31	1.05	2.39	4.26	6.16	8.06	9.99	11.94
% Change	na	na	na	na	236.8%	126.4%	78.7%	44.5%	31.0%	23.8%	19.5%
Penetration Rates											
Vehicles	0.0%	0.0%	0.1%	0.8%	1.4%	2.8%	4.4%	7.4%	10.8%	14.7%	18.8%
Households	0.0%	0.0%	0.0%	0.3%	1.0%	2.3%	4.0%	5.8%	7.5%	9.3%	11.0%
Population	0.0%	0.0%	0.0%	0.7%	1.4%	2.8%	4.7%	7.5%	10.8%	14.5%	18.4%
Subscribers by Service											
CD Radio	0.00	0.00	0.05	0.76	1.58	3.67	6.23	10.22	14.66	19.65	24.87
XM Satellite Radio	0.00	0.00	0.05	1.07	2.19	4.28	6.84	10.83	15.27	20.26	25.48
Other/New Entrants	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.47	1.04	1.95	2.91
Total DARS Subscribers	0.00	0.00	0.09	1.84	3.78	7.95	13.20	21.52	30.97	41.86	53.26
% Change											
CD Radio				1535%	108.0%	131.8%	69.7%	64.1%	43.5%	34.0%	26.6%
XM Satellite Radio				2207%	104.1%	95.2%	59.7%	58.4%	41.0%	32.6%	25.8%
Other/New Entrants				na	na	na	na	243.9%	120.8%	88.2%	49.1%
Total DARS Subscribers				1871%	105.7%	110.5%	66.0%	63.0%	43.9%	35.1%	27.2%
Market Share											
CD Radio	50.0%	41.5%	41.9%	46.2%	47.2%	47.5%	47.3%	46.9%	46.7%		
XM Satellite Radio	50.0%	58.5%	58.1%	53.8%	51.8%	50.3%	49.3%	48.4%	47.8%		
Other/New Entrants	0.0%	0.0%	0.0%	0.0%	1.0%	2.2%	3.3%	4.7%	5.5%		
Total DARS Subscribers	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		

Source: C.E. Unterberg, Towbin

Satellite Radio (DARS): U.S. Subscriber Forecast (millions)

Source: C.E. Unterberg, Towbin

Satellite Radio (DARS): U.S. Incremental Subscriber Growth (millions)

Source: C.E. Unterberg, Towbin

Satellite Radio (DARS): U.S. Incremental Subscriber Model by Market Segment (millions)											
(millions)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Subscribers by Service											
DARS Auto Subscribers	0.09	1.52	2.72	5.56	8.94	15.36	22.91	31.87	41.32		
DARS Home Subscribers	0.00	0.31	1.05	2.39	4.26	6.16	8.06	9.99	11.94		
Total DARS Subscribers	0.09	1.84	3.78	7.95	13.20	21.52	30.97	41.86	53.26		
Incremental Subscribers											
DARS Auto Subscribers	0.09	1.43	1.20	2.84	3.37	6.43	7.54	8.96	9.45		
DARS Home Subscribers	0.00	0.31	0.74	1.33	1.88	1.90	1.91	1.92	1.93		
Incremental DARS Subscribers	0.09	1.74	1.94	4.17	5.25	8.32	9.45	10.88	11.40		
Incremental Market Share - Auto											
CD Radio	50.0%	50.0%	50.0%	50.0%	48.7%	48.0%	47.0%	45.8%	45.8%		
XM Satellite Radio	50.0%	50.0%	50.0%	50.0%	48.7%	48.0%	47.0%	45.8%	45.8%		
Other/New Entrants	0.0%	0.0%	0.0%	0.0%	2.6%	4.0%	6.0%	8.4%	8.4%		
Total DARS Subscribers	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
Incremental Subscribers - Auto											
CD Radio	0.05	0.71	0.60	1.42	1.64	3.08	3.55	4.10	4.33		
XM Satellite Radio	0.05	0.71	0.60	1.42	1.64	3.08	3.55	4.10	4.33		
Other/New Entrants	0.00	0.00	0.00	0.00	0.09	0.26	0.45	0.75	0.79		
Total DARS Subscribers	0.09	1.43	1.20	2.84	3.37	6.43	7.54	8.96	9.45		
Incremental Market Share - Home											
CD Radio	0.0%	0.0%	30.0%	50.0%	48.7%	48.0%	47.0%	45.8%	45.8%		
XM Satellite Radio	0.0%	100.0%	70.0%	50.0%	48.7%	48.0%	47.0%	45.8%	45.8%		
Other/New Entrants	0.0%	0.0%	0.0%	0.0%	2.6%	4.0%	6.0%	8.4%	8.4%		
Total DARS Subscribers	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
Incremental Subscribers - Home											
CD Radio	0.00	0.00	0.22	0.67	0.91	0.91	0.90	0.88	0.89		
XM Satellite Radio	0.00	0.31	0.52	0.67	0.91	0.91	0.90	0.88	0.89		
Other/New Entrants	0.00	0.00	0.00	0.00	0.05	0.08	0.11	0.16	0.16		
Total DARS Subscribers	0.00	0.31	0.74	1.33	1.88	1.90	1.91	1.92	1.95		
Incremental Market Share - Overall											
CD Radio	50.0%	41.0%	42.4%	50.0%	48.7%	48.0%	47.0%	45.8%	45.8%		
XM Satellite Radio	50.0%	59.0%	57.6%	50.0%	48.7%	48.0%	47.0%	45.8%	45.8%		
Other/New Entrants	0.0%	0.0%	0.0%	0.0%	2.6%	4.0%	6.0%	8.4%	8.4%		
Total DARS Subscribers	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
Incremental Subscribers - Overall											
CD Radio	0.05	0.71	0.82	2.09	2.56	3.99	4.44	4.98	5.22		
XM Satellite Radio	0.05	1.03	1.12	2.09	2.56	3.99	4.44	4.98	5.22		
Other/New Entrants	0.00	0.00	0.00	0.00	0.14	0.33	0.57	0.91	0.96		
Incremental DARS Subscribers	0.09	1.74	1.94	4.17	5.25	8.32	9.45	10.88	11.40		

Source: C.E. Unterberg, Towbin

Satellite Radio (DARS): U.S. Service Rate(s) Forecast

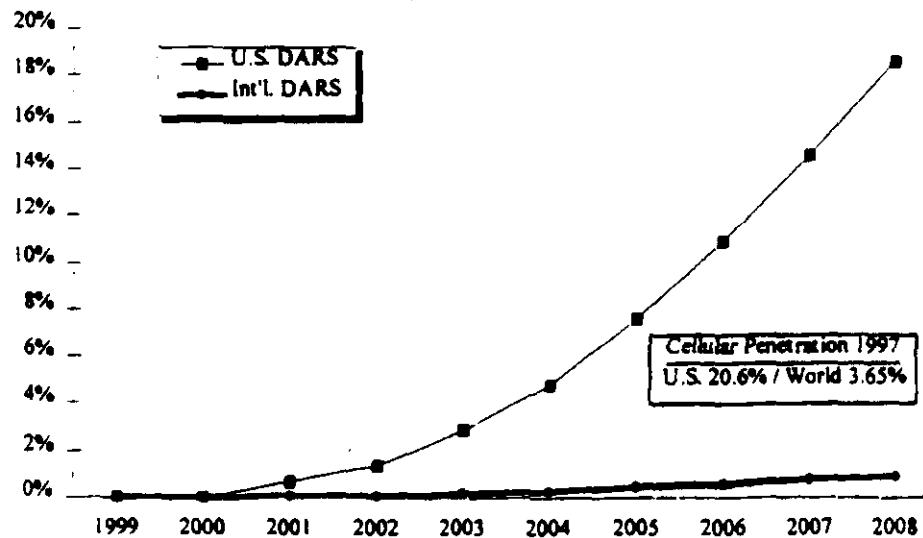
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Auto Service											
Average Monthly Rate	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
Home Service											
Average Monthly Rate	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
% Dual Service Subscribers (of Home subs.)	50%	53%	56%	59%	62%	65%	68%	71%	74%		
Dual Service Discount %	25%	25%	25%	30%	30%	40%	40%	50%	50%		
Discounted Dual Service Home Rate **	\$7.50	\$7.50	\$7.50	\$7.00	\$7.00	\$6.00	\$6.00	\$5.00	\$5.00		
Weighted Avg. Home Service Rate	\$8.75	\$8.68	\$8.60	\$8.23	\$8.14	\$7.40	\$7.28	\$6.45	\$6.30		
Initial Service Fee (one-time)	\$10.00	\$10.00	\$9.00	\$8.10	\$7.29	\$6.56	\$5.90	\$5.31	\$4.78		

Source: C.E. Unterberg, Towbin ** discounted home service rate for home subscribers also subscribing to auto service

Satellite Radio (DARS): International Subscriber Forecast

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
(millions)											
World Population (a)	5.918.6	5,996.2	6,073.1	6,149.4	6,223.5	6,301.4	6,377.2	6,452.8	6,528.3	6,603.9	6,680.3
Less U.S. Population (a)	(268.7)	(271.6)	(274.6)	(276.8)	(279.0)	(281.3)	(283.5)	(286.0)	(287.1)	(288.2)	(289.3)
Int'l. DARS Market	5,650.0	5,724.6	5,798.5	5,872.6	5,946.3	6,020.1	6,093.7	6,166.8	6,241.2	6,315.8	6,391.1
% Covered by DARS system	0.0%	80.0%	80.0%	81.0%	82.0%	83.0%	84.0%	85.0%	86.0%	87.0%	88.0%
Target Int'l. Population	0.0	4,579.7	4,638.8	4,756.8	4,876.1	4,996.7	5,118.7	5,241.8	5,367.4	5,494.7	5,580.1
Int'l DARS Receivers	0.0	0.18	1.39	2.38	5.85	8.49	13.82	22.02	27.91	34.07	40.18
% change	na	659.7%	70.9%	146.0%	45.2%	62.7%	59.3%	26.8%	22.1%	17.9%	
Penetration Rate (Target Pop.)	0.00%	0.00%	0.03%	0.05%	0.12%	0.17%	0.27%	0.42%	0.52%	0.62%	0.72%

Source: C.E. Unterberg, Towbin Other Sources: (a) U.S. Census Bureau

Satellite Radio (DARS): U.S and International Penetration Rates

Source: C.E. Unterberg, Towbin